

ARMY GROUND RISK-MANAGEMENT INFORMATION

Countermeasure

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Staying
Healthy
in the

ARMY GROUND RISK-MANAGEMENT INFORMATION **Countermeasure**

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features



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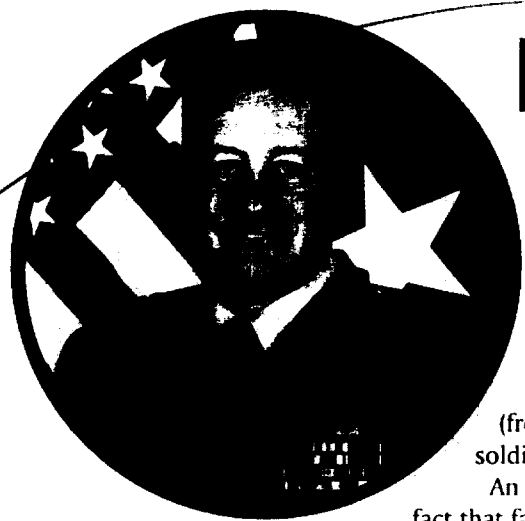
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DASAF'S CORNER

From the Director of Army Safety

Keeping the Attack Aggressive on Deadly POV Accidents

The most deadly threat that soldiers face in peacetime is traffic accidents. Privately owned vehicle (POV) accidents kill more soldiers than all other on- and off-duty accidents *combined*. Although many of the Army's POV accident prevention programs have resulted in a decrease in fatality rates (from 0.32 per 1,000 soldiers in the early 1980s to the current rate of 0.19 per 1,000 soldiers), POVs still remain the number one killer of our soldiers.

An alarming trend in the analysis of POV accidents from 1998 through 2002 is the fact that failure to use protective equipment such as seatbelts and motorcycle helmets is reported in at least 118 military injury or fatal accidents. Failure to use appropriate protective equipment is a clear indication of indiscipline—failure to follow an established standard. Ours is an Army built on standards and discipline and we, as commanders and leaders at all levels, owe it to our soldiers to strictly enforce standards, including ensuring that they are disciplined enough to wear protective equipment and obey traffic laws whether they are on or off duty.

The Army's senior leadership has made clear their determination to end this needless loss of soldiers to preventable POV accidents and the adverse impact it has on readiness. In August 2002, General Eric Shinseki, the Chief of Staff, Army (CSA), directed major commands to analyze their POV and Army motor vehicle accidents and provide a summary of command initiatives to reduce accidental losses. General Shinseki then directed in September 2002 that commanders increase enforcement of motorcycle safety training course requirements, and that those requirements not be deferred by commanders. In addition, General Shinseki has reinforced repeatedly his commitment to the Six-Point Model Program as the minimum standard for the Army POV accident prevention program.

Our major Army commands have implemented specific POV accident prevention initiatives. For example, Forces Command implemented the "Combating Aggressive Driving Program" in conjunction with the American Institute for Public Safety, which received Congressional recognition and authorization for FY02. A Fatality Review Board consisting of principal staff, medical doctors, and psychologists was established to identify accident causal factors and trends following each fatal accident. Other units and organizations—Training and Doctrine Command, U.S. Army Europe, National Guard Bureau, etc. have implemented aggressive programs designed to reduce POV accidents as well.

Armywide and joint service POV accident prevention initiatives also are being developed. The Army Safety Coordinating Panel (a general officer steering committee) chartered a POV process action team to assist the Army Chief of Staff for Installation Management in developing, resourcing, and implementing an Armywide traffic safety program through the newly created Installation Management Agency. A Joint Service Traffic Safety Task Force also has been activated to promote inter-service cooperation in the development and implementation of effective traffic safety programs, as well as increase cooperation between the services and other interested traffic safety organizations such as the National Highway Traffic Safety Administration.

To provide risk-management tools and assist commanders in building effective POV accident prevention programs, the U.S. Army Safety Center (USASC) has created several groundbreaking, high-definition video and film productions and other accident prevention initiatives. A total of 10 "Drive to Arrive" infomercials starring country music artists deliver short, to-the-point messages on specific driving hazards before feature movies in AAFES theaters worldwide. "Every Drive Counts" is an unconventional safety video set at the Airborne School connecting safe, high-risk training to off-duty activities, specifically POV driving. The USASC Web site (<http://safety.army.mil/>) contains a one-stop shopping POV accident prevention page, which includes the POV Toolbox (<http://safety.army.mil/pov/index.html>) and the Six-Point Model Program.

In addition to videos and Web-based tools, USASC provides enhanced POV accident prevention training to each resident CP-12 safety intern class and to aviation safety officers attending the Aviation Safety Officer Course. USASC's mobile training and assistance visit teams travel worldwide to teach NCO and junior officer risk-management courses and to selected brigade and battalion units to assist commanders, at their request, in assessing their safety programs, including POV accident prevention programs.

Every life is extraordinarily precious. The needless loss of any single one has a tremendous impact on the victim's family, the unit, and the Army's combat readiness. The standards, programs, and tools exist to help us protect soldiers from the hazards associated with operating POVs and motorcycles. From the unit level to the joint service level, we each must be dedicated to continually and aggressively enforcing standards and discipline and to using all of the model programs and tools to attack this killer of our soldiers. If your organization needs further assistance with your POV accident prevention programs, contact our staff at povspt@safetycenter.army.mil. ☛

Train Hard, Be Safe!

BG James E. Simmons



CRIMINAL Agents

Battlefield Foe, Lethal Enemy

With the recent massive deployment of U.S. troops to the Middle East, much talk has taken place concerning biological and chemical agents soldiers could be exposed to in a conflict there. On the biological side, deploying soldiers are routinely administered vaccines for contaminants such as smallpox and anthrax. However, there are no vaccines for chemical and nerve agents like tabun, sarin, soman, and VX—all just as deadly, if not more so, than biological threats.

The use of chemical and biological agents in war is not a new concept. The earliest recorded incident of chemical warfare occurred in the fifth century B.C. during one of a series of wars between Athens and Sparta, and the ancient Greeks used a combination of snake venom, gangrene, and tetanus to defeat their enemies. Centuries later, during World War I, the American Expeditionary Forces (AEF) in Europe suffered an estimated 200, if not more, battlefield fatalities as a direct result of poison gas exposure. Of 224,089 soldiers evacuated to medical facilities during that same conflict, records indicate 70,552 of these patients suffered from poison gas wounds, with 1,221 of them dying in AEF hospital wards. At the end of World War I General John J. Pershing, AEF Commander, told Congress, "Whether or not gas will be employed in future wars is a matter of conjecture, but the effect is so deadly to the unprepared that we can never afford to neglect the question."

In the years since World War I and ensuing conflicts, technology protecting soldiers from chemical and nerve agents has come a long way. Terms like "nuclear, biological, chemical" and "chemical protective undergarment" are standard Army vocabulary. However, although the Army has countermeasures in place should a biological or chemical attack be launched against soldiers, awareness is still a powerful weapon where chemical agents are concerned. Soldiers should know the signs and symptoms of exposure to the known chemical and nerve agents facing them, as well as treatment for themselves and their comrades should they come in contact with these lethal substances.

What are tabun, sarin, soman, and VX?

Tabun. Tabun, a colorless and tasteless liquid with a slightly fruity odor, was the first nerve agent discovered. It also kills quickly: the skin can absorb a fatal amount of tabun in only 1 to 2 minutes, with death following in 1 to 2 hours. Liquid tabun in the eyes and the inhaled form kill in 1 to 10 minutes. Victims of respiratory exposure exhibit symptoms much more quickly than those with skin exposure. Symptoms of tabun exposure include runny nose, tightening of the chest, dimness of vision, pinpointing of the pupils, difficulty breathing, drooling, excessive sweating, nausea, vomiting, cramps, involuntary urination and defecation, twitching, jerking, staggering, headache, confusion, drowsiness, coma, and convulsions. Symptoms are followed by a stop in breathing and death.

Sarin. Sarin is a colorless, non-persistent liquid that acts as a lethal cholinesterase inhibitor (i.e., blockage of nerve impulses). Sarin vapor is slightly heavier than air and hovers close to the ground. Sarin's lethal duration is dependent upon weather: under wet and humid conditions it degrades quickly but, as the temperature rises up to a certain point, the duration increases despite the humidity. Doses of sarin that are potentially life-threatening can be only slightly larger than those producing the least effects.

Depending upon the level of exposure, symptoms of sarin contact can occur within minutes or hours and include constriction of the pupils, visual effects, headache, pressure sensation, runny nose, nasal congestion, salivation, tightness in the chest, nausea, vomiting, giddiness, anxiety, difficulty thinking, difficulty sleeping, nightmares, muscle twitches, tremors, weakness, abdominal cramps, diarrhea, and involuntary urination and defecation. Severe exposure symptoms progress to convulsions and respiratory failure.

Soman. Soman, like sarin, is a lethal cholinesterase inhibitor. When pure, it is colorless and has a fruity smell; the industrial form is yellow-brown with a camphor-like odor. Similar to sarin, lethal doses of soman can be only slightly larger than doses that produce the least effects.

Symptoms of soman exposure can occur within minutes or hours and include constriction of the pupils, visual effects, headache, pressure sensation, runny nose, nasal congestion, salivation, tightness in the chest, nausea, vomiting, giddiness, anxiety, difficulty thinking, sleeplessness, nightmares, muscle twitches, tremors, weakness, abdominal cramps, diarrhea, and involuntary urination and defecation. Symptoms of severe exposure progress to convulsions and respiratory failure.

VX. VX is one of a series of extremely toxic compounds discovered in the United Kingdom and investigated by the Army beginning in 1953. Unlike "G-series" agents such as tabun, sarin, and soman, these newly discovered compounds were not only more toxic, but also more persistent than their earlier counterparts. VX is an oily liquid that is clear, tasteless, and odorless, although it can also be amber-colored and similar in appearance to motor oil.

Much like sarin and soman, symptoms of VX exposure can occur within a time span of minutes or hours, dependent upon the level of exposure. VX also shares similar symptoms with sarin and soman exposure: constriction of the pupils, visual effects, headache, pressure sensation, runny nose, nasal congestion, salivation, tightness in the chest, nausea, vomiting, giddiness, anxiety, difficulty thinking, sleeplessness, nightmares, muscle twitches, tremors, weakness, abdominal cramps, diarrhea, and involuntary urination and defecation. Severe exposure results in convulsions and respiratory failure.

How do you treat exposure to these agents?

Immediate treatment for tabun, sarin, soman, and VX exposure is the same for all four agents and is listed below. However, it is very important to know that any soldier who has come into contact with tabun, sarin, soman, or VX must seek medical treatment

immediately—**DO NOT DELAY!** Seconds count in minimizing the damage these agents inflict and in saving lives.

Soldiers who have inhaled tabun, sarin, soman, and VX should hold their breath until a respiratory protective mask is donned. If severe signs of exposure appear (chest tightening, pupil constriction, lack of coordination, etc.), all three Nerve Agent Antidote Kit, Mark I injectors (or atropine if directed by a physician), should be administered immediately in rapid succession. Injections using the Mark I kit injectors can be repeated at 5- to 20-minute intervals if signs and symptoms continue or worsen until three series of injections have been administered. No more injections should be given unless directed by medical personnel, and a record of all injections given should be maintained. If breathing has stopped, artificial respiration should be started; if mask-bag or oxygen delivery systems are not available, mouth-to-mouth resuscitation should be used except for cases of facial contamination.

If breathing is difficult, oxygen should be administered. Seek medical treatment immediately.

In cases of eye contact, the eyes should be flushed immediately with water for 10 to 15 minutes, followed by donning of the respiratory protective mask. Although miosis, or pinpointing of the pupils, can be an early sign of exposure, an injection should not be administered when it is the only symptom present. Instead, the victim should be taken immediately to a medical treatment facility for observation. In any case of suspected or known eye contact, medical treatment should be sought immediately.

When skin contact has occurred, contaminated clothing should be removed immediately and the respiratory protective mask donned. Immediately wash exposed skin with copious amounts of soap and water, 10-percent sodium carbonate solution, or 5-

**"Awareness
is still a
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agents are
concerned."**

percent liquid household bleach. Rinse well with water to remove excess decontaminants. The Nerve Agent Antidote Kit, Mark I, should be administered only if local sweating and muscle twitching are observed. Seek medical treatment immediately.

The first symptoms of tabun, sarin, soman, and VX ingestion are likely to be gastrointestinal. Do not induce vomiting to individuals who have swallowed these agents. Instead, immediately administer the Nerve Agent Antidote Kit, Mark I, and seek medical treatment immediately.

What is mustard?

Mustard, although toxic, is considered non-lethal by the Army. Complications from mustard exposure can lead to death, though. The liquid form of mustard is colorless when pure, but usually is brown and oily. The vapor form of mustard has a slight garlic or mustard odor. With either form, mustard remains a health hazard for an extended period of time.

Mustard is a blister agent that affects the eyes, skin, and lungs. Soldiers exposed to mustard may not notice symptoms for quite some time and feel very little pain. However, the longer the delay in removing the mustard agent from the body, the more severe the damage will be to affected areas. The eyes are very susceptible to mustard contamination and react to very low concentrations of the agent. Symptoms of skin exposure can vary from redness and inflammation to severe blisters and extreme soreness. Inhalation of mustard will cause throat irritation, chest tightening, and hoarseness and coughing. If medical treatment is not received in the early stages of mustard exposure, severe bronchopneumonia with accompanying high fever can occur. There is no known antidote for mustard exposure, and its consequent cellular destruction is irreversible. Anyone who has been exposed to mustard must seek medical treatment immediately.

What is the treatment for mustard exposure?


Individuals who have inhaled mustard

should hold their breath until the respiratory protective mask is donned and get away from the mustard source immediately. Oxygen should be administered if breathing is difficult; artificial respiration should begin if breathing stops. Mouth-to-mouth resuscitation should be used when oxygen delivery systems or approved mask-bag systems are not available, except in cases of facial contamination. Seek medical treatment immediately.


Speed in decontaminating the eyes is absolutely imperative for mustard-exposure victims. The eyes should be flushed immediately with water for at least 15 minutes by tilting the head to the side, pulling the eyelids apart, and pouring water slowly into the eyes. If protection is necessary, the eyes should be covered with dark or opaque goggles, not bandages. Seek medical treatment immediately.

For those who have come into skin contact with mustard, the respiratory protective mask should be donned, and within 1 minute the skin and clothes must be washed with a 5-percent solution of sodium hypochlorite or liquid household bleach. The clothing should then be cut off and removed and the affected skin area again flushed with a 5-percent sodium hypochlorite solution, followed by thorough washing with soap and water. Seek medical treatment immediately.

Vomiting should not be induced in cases where mustard has been ingested. Instead, give the victim milk to drink and seek medical attention immediately.

Danger looms in every battle, and chemical and nerve agents could pose a threat to our soldiers in this modern age of warfare. Know the threat, arm yourself with the facts, and stay alert to changing situations. You could save a life, as well as your own! 

POC: Julie Shelley, *Countermeasure* Managing Editor, DSN 558-2688, (334) 255-2688, e-mail julie.shelley@safetycenter.army.mil. Article compiled from information found on the Soldier Biological and Chemical Command Web site, <http://www.sbccom.army.mil>.



he Middle East and its desert environment are not new territory for the Army. Operations Desert Shield and Desert Storm and, most recently, Enduring Freedom, have tested the desert war fighting capability of our soldiers. In turn, our soldiers have proven their mettle on the desert battlefield.

Many of the soldiers facing deployment to the Middle East today have been to the deserts of that region before as part of one of the operations above or another mission. They remember the blistering effects of the sand, sun, and wind. However, scores of deploying soldiers have not had to endure the harsh and brutal conditions awaiting them halfway around the world.

Environmental effects of the desert can have a devastating impact on personnel if they are not prepared for it. Certain precautions must be taken to protect soldiers and their equipment during a desert deployment.

Factors such as acclimation, adequate hydration, sun protection, heat injury prevention, and other concerns must be dealt with before, and especially during, deployment to a desert region.

One of the biggest dangers facing soldiers in the desert is heat, and acclimation to that heat is vital to maintaining their health. Acclimation to heat is absolutely necessary for the body to reach and sustain efficiency in its cooling process. A period of 2 weeks should be allowed for acclimation, with progressive degrees of heat exposure and physical exertion—a gradual buildup to full performance. Although this strengthens heat resistance, there is no such thing as total protection against the debilitating effects of heat.

Radiant light from the sun is another danger soldiers should be prepared for in the desert. The sun's rays, either direct or bounced off the ground, affect the skin and can produce eye strain or temporarily impair vision. Overexposure to sunlight will cause sunburn, and excessive sunbathing or dozing in the desert sun can be fatal! People with fair, freckled skin, a ruddy complexion, or red hair are more susceptible to sunburn than others, but everyone is susceptible

**Don't Let the
Desert
Defeat
*You***

to some degree. A suntan will provide some protection against sunburn, but should be acquired gradually and in the early morning or late afternoon. "Gradual" means that the skin should be exposed no longer than 5 minutes on the first day, with 5 minutes more being added each additional day. Extreme caution should be used while working in the sun: the sun is as dangerous on cloudy days as sunny days, and sunscreen is not designed to give complete protection against excessive sun exposure. In all operational conditions, soldiers should be fully clothed in loose garments for sun protection and reducing sweat loss. When shade is required during the day, it can be provided best by tarpaulins or camouflage nets, preferably doubled to allow air circulation between the layers and dampened with any surplus water. Vehicle exteriors and tools can get extremely hot when exposed to sunlight for only a few minutes; crew members and maintenance personnel must wear gloves to prevent first- and second-degree burns when touching these items.

The combination of wind and dust or sand particles can cause extreme irritation to the mucous membranes, lips, and other exposed skin surfaces. Eye irritation caused by fine particles entering the eyes is a frequent complaint of vehicle crews, even when wearing goggles. Chapped lips are also common in the desert. The use of chapstick and skin and eye ointment is imperative in preventing and minimizing the effects of wind and sand.

Another danger of the desert is sandstorms. Fast, wind-blown sand produced in sandstorms can be extremely painful on bare skin, which is one reason why soldiers must be fully clothed at all times. When visibility is reduced by sandstorms to the extent that military operations are impossible, soldiers should not leave their group unless they are secured by lines for recovery. Pieces of cloth or bandannas must be carried to cover the face and neck during sandstorms. In sandstorms, vehicle drivers and other troops can get off course when they turn their heads to avoid sand being blown in their faces; for that reason, soldiers should take constant compass readings or use geographic reference points to stay in the right direction.

Climatic stress on the human body in the hot desert can be caused by any combination of air temperature, humidity, air movement, and radiant heat. The body also is affected adversely by such

factors as lack of acclimation, being overweight, dehydration, alcohol excess, lack of sleep, old age, or poor health. The ideal body temperature of 98.6 degrees F is maintained by conduction and convection, radiation, and evaporation, or sweat. The most important of these in daytime desert conditions is evaporation, since air temperature alone is probably already above skin temperature. However, if relative humidity is high, the air will not evaporate sweat easily and the cooling effect will be reduced.

Proper standards of personal hygiene must be maintained in the desert. Daily shaving and bathing are required if water is available; cleaning the areas of the body that sweat heavily is especially important. If sufficient water is not on hand for bathing soldiers can clean themselves by means of a sponge bath, solution-impregnated pads, a damp rag, or a dry, clean cloth. Underwear should be changed frequently and foot powder used often.

Soldiers should be checked for signs of injury, no matter how slight, as desert dust and insects can cause infection in minor cuts and scratches. Small quantities of disinfectant in washing water can reduce the chance of infection. It is important to remember that even minor sickness in the desert can have dire consequences—prickly heat and diarrhea can upset part of the sweating mechanism and increase water loss, raising susceptibility to heat illnesses. The buddy system can help ensure that prompt attention is given to these problems before they incapacitate soldiers.

The desert is full of diseases. Common scourges found in the desert include plague, typhus, malaria, dengue fever, dysentery, cholera, and typhoid. Although some of these illnesses can be prevented by vaccines or prophylactic measures, proper sanitation and personal cleanliness are vital to disease prevention. Proper mess sanitation is also essential in the desert.

The desert should not be feared, but preparation is key to surviving and winning a desert war. Arm yourself with the facts and stay safe!

POC: Julie Shelley, *Countermeasure* Managing Editor, DSN 558-2688, (334) 255-2688, e-mail julie.shelley@safetycenter.army.mil. Article compiled from material found on the Center for Army Lessons Learned Web site, <http://call.army.mil>.



Does your M2 .50-caliber machine gun have a lined or unlined barrel? The answer to that question could make a big difference if you are sending XM903 or XM962 sabot light armor penetrator (SLAP) ammo downrange. Here's a note from the program and item manager shops you need to check out if you have any unlined M2 barrels:

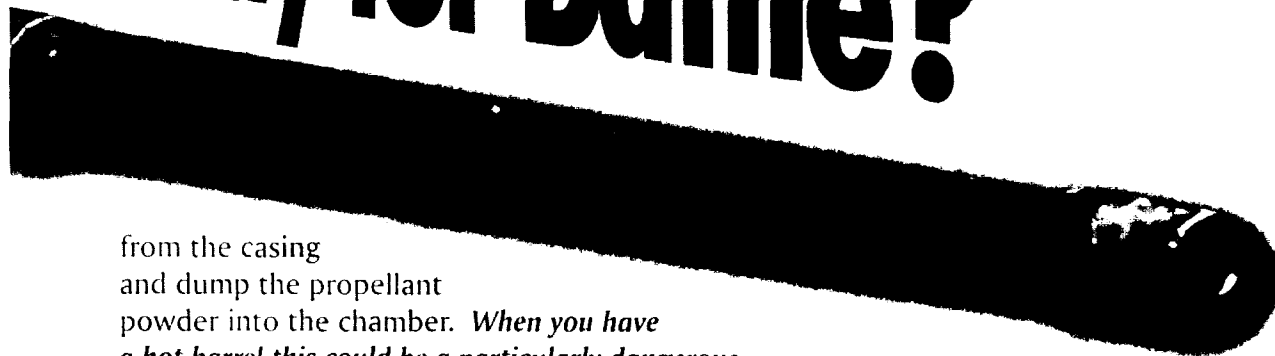
"The unlined barrel is not to be used when deployed. A message was sent out during the 1998 timeframe directing all units that the unlined barrel is to be used for training **ONLY**. A unit expecting to be deployed should not use the unlined barrel due to the probability of firing SLAP ammo. SLAP ammo will cause the unlined barrel to wear significantly faster than the lined barrel. The lined barrel is equipped with a stellite liner, which greatly enhances the life of the barrel.

If the unit has not replaced all their unlined barrels and is being deployed, we highly recommend they swap out their unlined barrels with a unit that is not currently being deployed. After they have swapped out the barrel, the unit should then procure the new lined barrel."

The life of an unlined barrel is about one-fifth that of a lined barrel—approximately 5,000 rounds compared to 25,000 to 30,000 rounds.

Barrel wear is not the only problem; other ugly things can happen with unlined barrels. If you chamber a SLAP round in an unlined barrel and don't fire the round, there is a good chance the sabot will "grab" the rifling. Then, when you try to extract the round, the sabot may separate

Is Your M2 Machine Gun Ready for Battle?



from the casing and dump the propellant powder into the chamber. *When you have a hot barrel this could be a particularly dangerous problem because of the probability of a cook-off.*

Here's some additional information from *PS Magazine*, Issue 521, page 34, "M2 Machine Gun ... The Line On Unlined Barrels":

"There are still some unlined M2 machine gun barrels in the field. A metal lining was added to most M2 barrels years ago to make them last longer.

"While unlined barrels work fine with .50-caliber ammo and can be used for training, they do not work fine with the new XM903 and XM962 SLAP ammo. SLAP ammo loses accuracy when fired through unlined barrels.

"Armorers, check your M2 barrels.

"Hold the barrel up to the light and look through the breech. If you have a lined barrel, there will be a gap in the lining 8 to 10 inches from the breech. No gap means an unlined barrel.

"If you find unlined barrels, it's OK to continue to use them, except with SLAP ammo. If your unit fires SLAP, exchange the unlined barrels for lined ones."

In addition to the note from *PS Magazine*, here is some additional information excerpted from a recent U.S. Army Reserve Command memorandum:

"Within the past few weeks, it has become apparent that screening for unlined barrels did not occur within war reserve stock. For this reason, it is requested that screening take place as soon as possible and this activity be notified of the results so we

can program in the quantity of lined barrels needed to support your requirement. It is important that these barrels be replaced.

"The M2 Unlined Barrel, NSN 105-00-652-8269, is of World War II vintage. To identify a lined barrel from an unlined barrel, look for the part number on the barrel. The part number for the lined barrel is 6528269; the part number for the unlined barrel is 7266131.

"No credit will be given for unlined barrels. These barrels can be used for training; however, at the same time, we must make sure that we do not take the risk and release any of the unlined barrels from war reserve stock to units deploying to a potentially hot environment. Lined barrels will be provided via receipt of a funded requisition. As stated above, it is important to provide the results to us as soon as possible in order to support your requirement. The updated POCs at TACOM at Rock Island, AMSTA-LC-CSIH, are: Item Manager, Ms. Deb Delf, DSN 793-2373, commercial (309) 782-2373; Equipment Specialist, Mr. Walter Hilliard, DSN 793-2108, commercial (309) 782-2108; Maintenance Engineer, Ms. Barbara Keleher, DSN 793-1896, commercial (309) 782-1896; Team Leader-Heavy Machine Gun Team, Ms. Pam Lund, DSN 793-7365, commercial (309) 782-7365."

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Who's Sleeping in My Bag?

Anyone who has served in the military for any length of time has found themselves living in the outdoors. We all have enjoyed the pleasures of at least one field training exercise. And, we will most likely have the opportunity to visit other domestic or foreign locations and sleep under the stars sometime in the near future. One common issue that must be considered while planning and preparing for the military camping package is that we will not be alone while living in the field.

There are approximately 850 types of ticks, 2,800 types of centipedes, 800 types of scorpions, and countless types of wasps, hornets, bees, arachnids, and ants—for the purposes of this article, we will classify these as "biting insects." As if that weren't enough company, there are also numerous variations of snakes and lizards, small-to-medium rodents, and mammals—we'll call these "animals."

Regardless of the circumstances of your trip to the field, maintaining situational awareness of the biting insects and animals that share your geographic area can save you from a possible life-threatening injury or becoming a disease and non-battle injury (DNBI). Loss of situational awareness or the onset of complacency easily can result in one of the following examples being used to describe you at your unit's next social function:

- SM was bitten by a black widow spider while he was putting on his boot.
- SM was picking up his load-bearing equipment (LBE) after using the wood line as a latrine. It was early morning and dark outside, and SM did not see the baby rattlesnake hidden under his LBE. SM was bitten by the snake and required medical attention.
- SM was bitten by ants and had an allergic reaction to the bites. The allergic reaction sent his body into shock. SM had to be airlifted for medical treatment. He had no prior knowledge of an allergy to ant bites.

Although there are numerous other examples of

soldiers falling victim to natural field inhabitants, these cover the basics. Conducting an ongoing risk assessment will allow you to identify these hazards and then devise actions that will mitigate these risks.

Field Manual (FM) 3-05.70, *Survival*, contains an extensive listing of information on the species and regional locations of both insects and animals (as well as plants) that are harmful to humans. Soldier Training Publication (STP) 21-24-SMCT, *Soldier's Manual of Common Tasks*, Task 081-831-0102, "Supervise Unit Preventive Medicine and Field Sanitation Procedures," addresses the leader's responsibility of identifying and dealing with field hazards, to include biting insects and animals.

Good platoon sergeants and first sergeants who are well versed in FM 21-101, *Field Sanitation*, MCRP 4-11.1.D, will:

- Plan for arthropod, rodent, and other animal threats.
- Enforce individual preventive medicine measures.
- Minimize exposure to arthropod, rodent, and animal threats.

The field sanitation team (FST) is the one team no one really wants to be on. Yet, in a field environment, it is the chain of

command's best tool to reduce and prevent DNBIs. Units must maintain a continuous field sanitation program that operates in garrison as well as when deployed. Too many times the kit rotates out of storage only for inventory during command inspections or change-of-command inventories.

Proper use of skin insect repellent (DEET) and clothing insect repellent (permethrin) is necessary to obtain maximum protection against insects and other biting creatures. But how many units do you know of that treat uniforms and sleeping equipment, to include tent liners, with permethrin as part of pre-combat inspections prior to deploying to the field for

training or military operations? FM 21-10/MCRP 4-11.1.D covers the requirements for treatment of such equipment. In addition, the uniform should be worn properly: pants tucked into boots, sleeves down, and undershirt tucked into pants.

Leaders must enforce the correct standards. Soldiers should not have to purchase their own insect repellents or, even worse, use improper equipment such as cat and dog flea collars. Leaders, you have the tools—use them.

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Desert Wildlife, Deployment Hazard

Soldiers in CONUS locations know that certain types of native wildlife pose unique hazards while in the field. The desert of the Middle East is no exception. Snakes, spiders, flies, and myriads of other "creeps" abound in the region. Deploying soldiers should be warned of the hazards posed by these native life forms and be aware of the proper procedures for dealing with them.

Snakes. (Bottom line)—tell your soldiers to leave snakes alone. There are poisonous snakes in the Middle East region (e.g., cobra and desert horned viper). Even bites from snakes that are not poisonous can be harmful. If not properly treated, non-poisonous snake bites can become infected. Anyone bitten by any snake should seek medical attention immediately for evaluation and anti-venom treatment. Tell soldiers not to treat snake bites with the "cut and suck" method.

Warn soldiers that snakes burrow under the sand seeking shade during the day and heat at night. Remind soldiers to avoid sudden motion when placing their hands or feet near an area that could conceal a snake. Soldiers should be especially careful when climbing or lifting objects from the ground.

Arachnids, arthropods, and biting insects. Scorpions, centipedes, assassin bugs,

black widow spiders, mosquitoes, and sand flies can cause illness and infected wounds. Remind soldiers to shake out their clothing before dressing and to check boots before putting them on. When possible, boots should be placed off the ground or inside a waterproof bag or other container. Soldiers also should carefully check their bedding before use. In addition, remind soldiers that food crumbs attract insects that, in turn, attract spiders and scorpions.

Direct soldiers to use insect repellents religiously and to use only those approved for human use. DEET repellent lotion (NSN 6840-01-284-3982) is recommended for skin use. Permethrin clothing repellent (NSN 6840-01-278-1336) is available for use on clothing only. Caution soldiers to follow carefully the instructions for use of these products. Soldiers also should be warned to remain still if they feel an insect or spider crawling on their body—sudden movement could cause a bite or sting.

Animals. Animals can be carriers of rabies. Warn soldiers not to taunt or play with animals.

Derived from the Southwest Asia Leader's Safety Guide, U.S. Army Safety Center. The complete guide is available on the USASC Web site at <http://safety.army.mil/>.

Water is a precious resource that many of us take for granted. We can turn a knob on a tap and water is readily available to us. Not only is that water easy to get, but it's also safe to drink. Soldiers deploying to a desert environment don't enjoy such luxuries, however. In the desert, water—especially safe drinking water—is invaluable.

Soldiers must stay adequately hydrated to survive in the desert and maximize their warfighting effectiveness. Potable, or drinkable, water is the most basic need in the desert. The human body depends heavily on water: approximately 75 percent of the human body is made up of fluid. A loss of fluid of two quarts, or 2.5 percent of body weight, decreases efficiency by 25 percent. A loss of fluid equal to 15 percent of body weight is usually fatal.

Merely finding a water source is not enough, though. It is vital to ensure that there is no possibility of nonpotable water being mistaken for drinking water. Safe, potable water is essential to the Army. Water that is not properly treated can transmit a multitude of diseases including typhoid fever, dysentery, cholera, and diarrhea. In some areas, contaminated water can also be a means of transmitting hepatitis and other infections. In addition, skin infections can be transmitted by

a planning factor of at least 7 gallons of water per soldier, per 24-hour period. In desert terrain, approximately 9 quarts of water per soldier, per day, is needed. When soldiers are active, leaders must oversee the drinking of two quarts of water per hour, per soldier. Soldiers cannot be trained to adjust permanently to a reduced water intake. An acclimated soldier will require as much, if not more, water because he sweats more readily. In very hot conditions, it is better to drink smaller amounts of water more often than to take large amounts occasionally. Drinking large amounts of water causes waste by excessive sweating and also could cause heat cramps.

Leaders in the field have many responsibilities associated with their duty, and ensuring the water supply is safe is one. Leaders should check their soldiers' water and make sure it is cool and drinkable. Planning is a must on the part of leaders. For example, sufficient water must be carried on a vehicle to last until the next planned resupply, plus a small reserve. Care must be taken to guard against polluting water sources. If water rationing is in effect, water should be issued under the close supervision of officers and NCOs. If the ration is not sufficient for the type of activity being performed, there is no alternative but to reduce physical activity

The Clear Facts

polluted water. Drinking water must be taken only from approved sources to avoid disease and other pollutants.

The following guidelines should be used for safe water treatment:

- Treat the individual water supply with one iodine tablet per quart-size canteen if the water is clear; use two iodine tablets if the water is cloudy.
- Let the canteen stand for 5 minutes with the cap loosened and then shake; let leakage rinse the thread around the neck.
- Tighten the cap and let the canteen stand for another 20 minutes.
- Calcium hypochlorite also can be used: add one ampule in one-half canteen cup of water, let dissolve, and then pour one canteen cap of the solution into the canteen, shake, and let stand for 30 minutes.

Lessons learned from Operations Desert Shield and Desert Storm showed that units should use

or restrict it to the cooler parts of the day. As physical activity increases, soldiers should drink more water.

Dehydration

Dehydration is deadly and hits fast. During high desert temperatures, a resting soldier can lose as much as a pint of water per hour through sweating! Sweating also can be deceptive in certain conditions. When temperatures are very high and the humidity is low, sweating may go unnoticed because it evaporates so quickly the skin will appear dry. Whenever possible, sweat should be left on the body to improve the cooling process. The only way to accomplish this is to avoid direct sunlight, which is the most important reason why soldiers must remain fully clothed, even in searing temperatures.

At the beginning of their deployment, soldiers may not always drink the amount of water they

require. Because of this, newly deployed soldiers need to be encouraged to drink more, especially during acclimation. NCOs and officers must keep track of how much their troops drink to ensure they drink **enough** water. These same leaders, as well as the soldiers themselves, should also look for the warning signs of dehydration. Very dark urine is often a warning sign; other symptoms include sunken eyes, dry or sticky mucous membranes in the mouth, decreased or absent urination, decreased tears, deep and rapid breathing, lethargy, or coma. When pinched, the skin may sag **back** into position slowly. Thirst is not an adequate indicator of dehydration because the sensation may not be felt until there is a deficit of 1 to 2 quarts of water.

Overhydration

The flip side of dehydration is overhydration—or simply put, drinking too much water too quickly. When sodium is lost through sweating and water is drunk as the replacement fluid over a period of hours, the sodium left in the blood can become diluted. This dilution can cause a condition called “hyponatremia,” which can lead to damage in certain kinds of tissues in the body. Changes are most noticeable in the nervous system, where seizures, coma, and even death can occur.

Recognizing overhydration or hyponatremia is challenging because the symptoms can resemble those

on Water

of heat stroke or heat exhaustion. Early symptoms include confusion, nausea, fatigue, muscle cramps, and weakness. More serious symptoms include vomiting, muscle twitches, delirium, seizures, and coma. The main difference between heat stroke and heat exhaustion, when compared to overhydration, is that overhydration doesn't cause the victim's temperature to rise. Because overhydration can be deadly, the final diagnosis must be made at a medical facility where the victim can be treated properly.

Salt

Salt in correct proportions is vital to the normal functioning of the human body. One of those functions is sweating, which sheds salt from the body—the more you sweat, the more salt you lose. Unacclimated soldiers need more salt during their first few days of desert deployment. Each meal, ready-to-eat (MRE) contains enough salt for a soldier drinking up to 4 quarts of water.

all soldiers need additional salt when sweating heavily. Supplemental salt must be taken under medical direction: too much salt can cause thirst and a feeling of sickness, and can be dangerous. Extra salt should be taken only in proportion to water intake. Additional salt intake in any form should be controlled strictly according to medical advice.

Storage

When a potable water source has been secured and water properly treated, how should it be stored? Only issued water containers should be carried for drinking water. The best containers for small quantities of water (5 gallons or less) are plastic water cans. Water in plastic cans will be good for up to 72 hours, while water stored in metal cans stays drinkable for only 24 hours. Water in canteens should be changed at least every 24 hours, however.

Larger quantities of water kept in water trailers will last up to 5 days, if kept in the shade. The ideal drinking water temperature is between 50 and 60 degrees F. Outside temperature is a large factor in water storage: if the temperature outside exceeds 100 degrees F, water temperature must be monitored; water with a temperature in excess of 92 degrees F should be changed because of bacteria buildup. Ice

in containers will keep water cool, but should be used with care in water trailers—the inner protection of the trailer can be destroyed by floating ice. Ice in water trailers must be removed before the trailer is moved to prevent damage to the trailer. It is also a good idea to erect shade for water trailers, because this allows the water to stay much cooler. Lister bags and wet cloths can be used around metal containers to help keep them cool.

Water that is not fit to drink but otherwise not dangerous (e.g., it contains too much salt) can be used to aid in cooling. Such water can be used to wet clothing so the body does not use so much of its own internal cooling system—sweating. Soldiers must be trained not to waste water. Water that has been used for washing socks or other clothing, for example, is perfectly okay for use in a vehicle cooling system. It is important to note that untested water should not be used for washing clothes, although it can be used for vehicle cooling systems or vehicle decontamination.

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A soldier, up early to prepare breakfast for his fellow troops, is tired from yesterday's activities. He reaches for the 5-gallon water can to make hot cereal on the M-2A burner. As he pours water into the pot, the burner's flame intensifies, burning the soldier and destroying the mobile kitchen. He had mistakenly grabbed the fuel can instead of the water can.

Another soldier uses a 5-gallon fuel can to refuel his vehicle with diesel fuel. Unbeknownst to him, this fuel can is full of MOGAS and not labeled properly. This error causes serious engine problems and a maintenance nightmare.

Several soldiers are refilling their canteens from a water can. They do not know it yet, but this water can is full of antifreeze. This oversight causes grave health problems.

Mistaking a 5-gallon fuel can for a 5-gallon water can causes serious problems, including burns and fires. These 5-gallon fuel cans also can be used to store a variety of fuels. To avoid potential problems, cans must be labeled correctly. Cans that are either

labeled incorrectly or contain the wrong liquid and consequential mistakes in use will lead to maintenance and safety problems. To reduce the risks associated with water and fuel can "mistaken identity," know the distinctions between the two cans.

Fuel and water cans have the same dimensions, and cans are labeled with an "X" on each side. The "X" has a circle in the middle that surrounds the identity of the liquid in the can: "WATER" for the water can, and "FUEL" for the fuel can. Fuel and water cans may be the same color (tan or black), so it is not possible to identify the liquid in the can by its color. Fuel cans may also be labeled with different colors, according to which fuel they store. To prevent confusion with improperly marked cans in the field, adhere to the following directions:

Mark each container with either the standard or short nomenclature identification on the side ends of the can. The short nomenclatures authorized for field use are MOGAS (for motor gasoline), DF (for diesel fuel), or JP (for turbine fuel/jet propulsion).

When labeling turbine fuel, be sure to mark the appropriate number: JP-4, JP-5, or JP-8. Additional information that may be placed on the can includes the NATO code number, the filling date, the weight or volume of the contents, and safety markings. All markings on 5-gallon cans should be in 3/4-inch letters.

When coloring the cans, paint the upper third of the can the appropriate color. Use an oil-based enamel, such as automotive spray paint, and prepare the surface by first washing it off with isopropyl alcohol (rubbing alcohol) and then roughening it lightly with sandpaper. Cans containing MOGAS should be painted red in the upper third of the can. Cans containing diesel fuel should be painted yellow in the upper third of the can. Do not paint cans containing turbine fuel (JP-4, JP-5, or JP-8), but mark them instead. Remember to get your commanding officer's approval before painting and stenciling your can.

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